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1. *On the classification of the Pterophoridae.*

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[Read August 5th, 1885.]

THE following notes include (1) an attempt to settle definitely the systematic position and rank of the group, (2) a partial revision of the genera contained in it, and (3) descriptions of some new exotic species.

The first question does not appear to me to present anything like the difficulty which is popularly expected of it. The suggestions of one writer that the group should be included amongst the *Bombycina*, and of another that it has direct affinity with certain *Hymenoptera*, I regard as ridiculous conjectures, quite without any reasonable foundation. Others, again, have confused the issue by classing among the *Pterophoridae* genera which have no real connection with the family. My own conclusion is that the group constitutes a family of *Pyralidina*, of similar value with the *Botyridae* and other allied families, and that it may be placed, together with the *Tineodidae* and *Oxychirotidae*, as I have elsewhere defined them, next the *Crumbidae* and *Scopariade*.

Omitting the characters which are shared by the *Pterophoridae* with the rest of the *Pyralidina*, the following is a definition of the family:—

PTEROPHORIDÆ.

No ocelli. No maxillary palpi. Abdominal uncus in male well-developed. Fore wings with vein 7 separate or absent. Hind wings with vein 6 separate from 7, 8 free but closely approximated to 7 on cell, lower median not pectinated. Wings usually fissured (except *Agdistis*).

So far as my investigations go, these characters hold universally, with the exception of the last (which is the least important), and are sufficient to separate the *Pterophoridae* from each of the other families of *Pyralidina*. Lord Walsingham, however, describes the genus *Cenoloba* (with which I am not acquainted) as possessing "drooping maxillary palpi," though he lays no stress on this exception. Considering the remarkable character of the structure attributed to this genus, which was founded on a single much-damaged specimen, I think that, without expressing any doubt of Lord Walsingham's accuracy, it will be wise to avoid basing any definite conclusions upon its alleged abnormal peculiarities, until they are confirmed from further specimens; but some remarks on this genus will be found later.

Now compare with the above definition the characters of *Scoptonoma*, classed by Zeller as an eccentric Pterophorid. I possess a type of *Scoptonoma Peterseni*, kindly communicated by Lord Walsingham; it has conspicuous ocelli, well-developed maxillary palpi, no apparent uncus, and in the hind wings vein 7 rising out of 6 and anastomosing with 8, with all the wings entire. It therefore disagrees with the *Pterophoridae* in almost every point, and cannot possibly have any direct connection with them; whilst on the other hand it agrees in all essential characters with the *Botydidæ*, and should undoubtedly be referred to that family; of the genera with which I am acquainted in nature it approaches nearest to *Rhimphalea*.

Certain authorities have also referred to the *Pterophoridae* the genus *Schreckensteini* (*Chrysocoris*), a proceeding which appears to me still more unwarranted. In this case the structure of the genus should be compared not so much with the special family characters

given above, as with those shared by all the *Pyralidina*, since *Schreckensteinia* does not belong to that group at all, but to the *Tineina*, with which it is usually correctly placed, ranking under the *Elachistidae* next *Stathmopoda*. A comparison of the neuration will be sufficient. In the *Pyralidina* veins 8 and 9 of the fore wings (vein 8 being always the supra-apical vein) are always stalked; vein 8 of the hind wings is partially closely approximated to 7 (often anastomosing). In *Schreckensteinia* veins 8 and 9 of the fore wings are separate; vein 8 of the hind wings is widely remote from 7 throughout. These differences are conclusive; the first alone would be amply sufficient. The abdominal uncus seems to be absent (at least I found no trace of it in one specimen dissected), and the wings are not fissured. The hairiness of the larva, which seems to have been the only reason alleged for the transference of *Schreckensteinia* to the *Pterophoridae*, is a character of the most trifling importance in classification; it recurs in almost every principal group, and, as usual with dermal appendages, depends mainly on external circumstances of life. Compare the water-breathing gill-apparatus of the larvæ of certain *Hydrocampidae*, a much more remarkable structure, yet insufficient even to delimit genera.

I proceed now to state the main characters of the *Pyralidina*, with the object of showing that the *Pterophoridae* are justly included in that group; these are as follows;—

Fore wings with normally 12 veins, 1*a* and 1*b* present, 1*b* almost always simple at base, 5 belonging to system of lower median, 6 from middle of transverse vein, independent, 7 belonging to system of upper median, 8 supra-apical, 8 and 9 stalked, 12 free. Hind wings with normally 8 veins, 1*a*, 1*b*, and 1*c* present, 5 belonging to system of lower median, 6 belonging to system of upper median, 8 in part closely approximated to 7, usually anastomosing with it beyond cell, posteriorly divergent.

With the above type the *Pterophoridae* agree absolutely in every particular, and this combination of characters is not found in any other group, except the *Pyralidina*. But, in order to distinguish this type of neuration in the *Pterophoridae*, it is necessary to examine the older and more ancestral genera, in which the fission of the wings has not proceeded far; in the more advanced forms is

found a rapid degradation, causing the obsolescence of most of the veins, so that the affinity of these forms, if they stood alone, could not possibly be demonstrated. The progressive obsolescence of the veins takes place as follows, all the stages occurring in different genera: the fission of the wings, occurring opposite the middle of the cell, causes 5 and 6 in both wings to become very short, but these veins, with the transverse vein, though becoming very indistinct and feeble, do not disappear, except in the extreme type *Cosmoclostis*, where the fissure extends more than two-thirds of the length of the wing; in the fore wings 2 and 3 then become gradually coincident with 4, and 7, 9, 10 and 11 with 8; in the hind wings 3 becomes coincident with 4, and in the extreme type 2 also coincides with 4 and 8 with 7. The neuriation is thus finally reduced to four simple independent veins in the fore wings, and three in the hind wings. Keeping in mind the principles that a vein once merged by coincidence cannot possibly reappear, and that a fissure once made can never be filled up, there is no difficulty in constructing a genealogical sequence of the genera, which will show, if not certainly the actual, at least a possible order of development. The genealogical connection is indicated, as far as possible, in the generic descriptions hereafter following.

Regarding the connection of the *Pterophoridae* with the other families of the *Pyralidina*, it may be pointed out that the development of the uncus shows that they are not derived from the *Botyridae*, and the separation of vein 7 of the fore wings that they are not derived from the *Pyralididae*, whilst the absence of any pectination of the lower median vein of the hind wings indicates that there is probably no immediate connection with the *Crambidae* or *Phycididae*. From the other families they mostly differ by vein 8 of the hind wings not anastomosing with 7, and it is therefore probable that they do not originate from any known existing form, but from an extinct type closely approaching the ancestral form of the *Pyralidina*, and now apparently most nearly represented by the *Tineodidae*.

In the foregoing remarks no allusion is made to the *Alucitidae*. The following is a sufficient definition of the family characters:—

## ALUCITIDÆ.

Ocelli present. Maxillary palpi absent. Labial palpi long, curved. Wings six-cleft; no cell. Abdominal uncus in male developed. Hind wings with vein 8 free.

The single known genus has suffered so much degradation that it is in my opinion impossible to locate it with certainty, unless earlier connecting forms are hereafter discovered. The cell and many of the normal veins are obsolete, so that the type of neuration cannot be made out. The genus possesses ocelli, and therefore cannot be derived from the *Pterophoridae* (on the principle that organs once lost cannot reappear); on the other hand, the excessive fission of the wings shows that the *Pterophoridae* cannot be derived from *Alucita*. Notwithstanding, since the neuration of *Alucita*, though degraded, has nothing in it inconsistent with that of the *Pterophoridae*, and since fission of the wings is not found in any other group of Lepidoptera except these two, it seems reasonable to refer the *Alucitidæ* also to the *Pyralidina*, with which they agree in such characters as are not obscured by degradation. I consider, therefore, that we are justified in inferring that the *Alucitidæ* constitute a family of *Pyralidina*, allied to but distinct from the *Pterophoridae* and *Tincodidæ*, and that, like these, it originated from an extinct type approaching the ancestral form of the *Pyralidina*. The actual neuration of *Alucita* is given hereafter under the generic heading.

For the following partial generic revision I have examined all the species which I have to hand, not a very large number; my results may therefore require extension, but will, I hope, be found accurate so far as they go. I find that the neuration presents the best characters for generic definition, and is here, as usually, the most reliable guide, and my classification is mainly founded on it. The form of the wings I consider an indefinite and unreliable character, but the number of fissures is a good point. The thickening of the legs with scales is practically of no value, as it is impossible to decide where the line is to be drawn, and the same may be said of the difference in length of the spurs. The frontal tuft is again a doubtful character; although so strongly developed in some species, every intermediate

stage down to obsolescence is found, yet it indicates real affinity, and can be employed in certain cases. The form of the palpi does not offer much definite variation, and is rarely of value. The structure of the antennæ is practically almost identical throughout the family. The possession of black scales in the cilia of the third segment of the hind wings is a good indication, and seems on the whole to be a fairly reliable character, though it cannot always be employed, and in some cases these scales are very slightly developed.

The following is a tabulation of, so far as I am aware, all the genera known at present to exist; I have omitted *Amblyptilia*, Hb., and *Cnemidophorus*, Wallgr., which I consider not distinct from *Platyptilia*, Hb.:—

1. Wings entire .. .. .	<i>Agdistis</i> .
"   fissured .. .. .	2.
2. Hind wings bifid .. .. .	<i>Cenoloba</i> .
"   trifid .. .. .	3.
3. Fore wings quadrifid .. .. .	<i>Heptaloba</i> .
"   trifid .. .. .	<i>Deutero copus</i>
"   bifid .. .. .	4.
4. Fore wings with vein 9 present .. .. .	5.
"   "   absent .. .. .	10.
5. Hind wings with black scales in dorsal cilia .. .. .	6.
"   without black scales in dorsal cilia .. .. .	8.
6. Fore wings with vein 3 present .. .. .	<i>Platyptilia</i> .
"   "   absent .. .. .	7.
7. Fore wings with vein 10 stalked with 11 .. .. .	<i>Sphenarches</i> .
"   "   10 stalked with 8 .. .. .	<i>Oxyptilus</i> .
8. Fore wings with vein 10 present .. .. .	<i>Mimeseoptilus</i> .
"   "   absent .. .. .	9.
9. Forehead with cone of scales .. .. .	<i>Marasmarcha</i> .
"   without cone .. .. .	<i>Lioptilus</i> .
10. Fore wings with vein 7 present .. .. .	11.
"   "   absent .. .. .	12.
11. Posterior tarsi tufted above on joints .. .. .	<i>Pterophorus</i> .
"   not tufted .. .. .	<i>Oedematophorus</i> .
12. Forehead with cone of scales .. .. .	<i>Doxosteres</i> .
"   without cone .. .. .	13.
13. Wings without cell .. .. .	<i>Cosmoclostis</i> .
"   with cell .. .. .	14.
14. Fore wings with vein 11 from near 8, long, parallel .. .. .	<i>Trichoptilus</i> .
"   "   absent, or rarely from point .. .. .	
"   with 8, short, divergent .. .. .	<i>Aciptilia</i> .

## COSMOCLOSTIS, n. g.

Forehead without tuft; a high scaled transverse ridge between antennæ. Antennæ in male —(?), in female minutely pubescent. Palpi moderately long, very slender, filiform, 2nd joint ascending, terminal joint almost as long as 2nd, porrected, somewhat pointed. Posterior tibiæ slightly thickened on origin of spurs. Fore wings bifid, cleft from before one-third; no cell; 2 and 3 absent; 5, 6, 7 absent; 9, 10, 11 absent. Hind wings trifid, 3rd segment without black scales in dorsal cilia; no cell; 2 and 3 absent, 5 and 6 absent, 8 absent,

Founded on the single species described below; the most extreme type known, with the longest fissure and most degraded neuration; it is therefore presumably one of the most recently-developed forms, and apparently originates from *Trichoptilus*.

TRICHOPTILUS, *Wlsm.*

Forehead without tuft. Antennæ in male minutely or moderately ciliated (one fifth to two-thirds). Palpi moderate, ascending, 2nd joint with short projecting scales beneath, tending to form a short angular apical tuft, terminal joint short or long, filiform, tolerably pointed. Tibiæ thickened with scales on origin of spurs. Fore wings bifid, cleft from before middle; 2 out of 4 or absent, 3 absent, 5 and 6 extremely short, 7 absent, 9 absent, 10 absent or from near 8, long, 11 long. Hind wings trifid, 3rd segment usually with a few black scales in dorsal cilia; 2 from middle of cell, 3 absent, 5 and 6 very short, 7 to apex.

I do not certainly know whether the name *Trichoptilus* justly belongs to the genus here described; Lord Walsingham founded the genus on a single Californian species, *T. pygmæus*, which I have not seen, and gives no particulars of the neuration; I believe, however, that the species is congeneric with those described hereafter. Besides the six given here, I have another species from Mauritius, not in a condition to be described; and I consider that to this genus should probably also be referred *Aciptilus siceliota*, Z., *Oxyptilus Kollari*, Stt., and *Aciptilus californicus*, Wlsm. Of the six species examined vein 10 of the fore wings was present in *T. comsochares* and *T. centetes*. The genus is a degenerate development of *Oxyptilus*.

## OXYPTILUS, Z.

Forehead without tuft. Antennæ minutely ciliated (not over  $\frac{1}{2}$ ). Palpi moderate, ascending, 2nd joint with projecting scales beneath, forming a short angular apical tuft, terminal joint moderate, filiform, tolerably acute. Tibiæ thickened with scales on origin of spurs. Fore wings bifid, cleft from about middle; 2 and 4 stalked, 3 absent, 5 and 6 very short, 7 from below angle of cell, long, 8 and 9 long-stalked, 10 out of 8, 11 from very near angle. Hind wings trifold, 3rd segment with a tuft of black scales in dorsal cilia; 2 from middle of cell, 3 from near angle, very short, 5 and 6 very short, 7 to apex.

The species examined were *O. pilosellæ*, *O. hieracii*, and *O. parvidactylus*. The genus is derivable from *Platyptilia*.

## SPHENARCHES, n. g.

Forehead without tuft. Antennæ minutely ciliated ( $\frac{1}{2}$ ). Palpi moderately long, ascending, 2nd joint with scales hardly projecting beneath, terminal joint long, filiform, tolerably pointed. Tibiæ thickened with scales on origin of spurs. Fore wings bifid, cleft from middle; 2 and 4 stalked, 3 absent, 5 and 6 very short, 7 from below angle of cell, long, 8 and 9 long-stalked, 10 and 11 stalked. Hind wings trifold, 3rd segment with a tuft of black scales in dorsal cilia; 2 from middle of cell, 3 absent, 5 and 6 very short, 7 to apex.

Founded on the single species described below; a development of *Platyptilia*, and intermediate in general characters between *Oxyptilus* and *Deutero copus*.

## DEUTEROCOPUS, Z.

Forehead without tuft. Antennæ in male —(?). Palpi moderate, ascending, 2nd joint with appressed scales, terminal joint moderate, acute. Tibiæ thickened on origin of spurs with dense spreading whorls of scales; posterior tarsi with similar smaller whorls on apex of two basal joints. Fore wings trifold, cleft centrally from middle and lower segment cleft from two-thirds; 2 and 4 from point of angle of cell, 3 absent, 5 and 6 very short, 7 from below angle, long, 8 and 9 long-stalked, 10 from near angle, 11 from near 10. Hind wings trifold, 3rd segment unusually short, terminating in a tuft of black scales; 2 from middle of cell, 3 absent, 5 and 6 very short, 7 to apex.

I have examined *D. Tengstræmi*, the only known species. The genus is derived from *Platyptilia*, and otherwise most allied to *Sphenarches*.



HEPTALOBA, *Wlsm.*

I have not seen this genus, of which the neuration is not given; it appears to be also a development of *Platyptilia*.

PLATYPTILIA, *Hb.*

Forehead with tufts of scales. Antennæ in male ciliated ( $\frac{1}{4}$ —1). Palpi rather long, obliquely ascending, 2nd joint loosely scaled, terminal joint moderate, porrected, filiform, tolerably obtuse. Tibiæ simple, or rather tufted on origin of spurs and centre of middle tibiæ. Fore wings bifid, cleft from two-thirds to three-fourths; 2 from considerably below angle of cell, 3 from very near angle, 5 and 6 short, 7 from below angle, 8 and 9 stalked, 10 from near angle, 11 tolerably remote. Hind wings trifold, 3rd segment with black scales in dorsal cilia; 2 from middle of cell, 3 from near angle, 5 and 6 short, 7 and 8 divergent from beyond cleft.

A development of *Mimesoptilus*, with which it agrees in neuration, and differs essentially only by the black scales in the cilia of the hind wings; and even these are sometimes very inconspicuous. In *P. hemimetra* the frontal tuft appears to be absent, and in some other species it is very short. The scaling of the legs differs specifically, as do also the scales in the cilia of fore wings, but these characters appear too indefinite and unreliable for generic subdivision; I therefore regard *Amblyptilia*, *Hb.*, and *Cnemidophorus*, *Wallgr.*, as not distinct genera. I have examined about twelve species. I see no sufficient reason for changing the name of this genus (which is not incorrectly formed) to *Platyptilus*, as suggested by Zeller; and the same remark applies to *Aciptilia*.

ACIPTILIA, *Hb.*

Forehead without tuft. Antennæ in male moderately ciliated ( $\frac{1}{2}$ —1). Palpi moderate, more or less ascending, filiform, 2nd joint sometimes loosely scaled, terminal joint moderate or short, acute. Posterior tibiæ simple. Fore wings bifid, cleft from about middle; 2 from near angle or out of 4 or absent, 3 absent, 5 and 6 very short, 7 absent, 9 absent, 10 absent, 11 from a point with 8 or absent. Hind wings trifold, 3rd segment without black scales in cilia; 2 from middle of cell, 3 absent, 5 and 6 very short, 7 to apex.

Apparently derived from *Lioptilus*. I have examined about a dozen species, of which *A. galactoductyla* was the only one in which vein 11 of the fore wings was present; this is therefore one of the oldest species.

## LIOPTILUS, Wallgr.

Forehead without tuft. Antennæ in male moderately ciliated. Palpi rather short, slender, filiform, obliquely ascending, pointed. Tibiæ simple. Fore wings bifid, cleft from about middle; 2 from three-fourths of cell, 3 from a point with 4, 5 and 6 very short, 7 from below angle, 8 and 9 stalked, 10 absent, 11 from near angle. Hind wings trifid, 3rd segment without black scales in dorsal cilia; 2 from middle of cell, 3 absent, 5 and 8 very short, 7 to apex.

I have only been able to examine *L. microdactylus*, and these characters may require some extension; the genus is a development of *Marasmarcha*.

## OEDEMATOPHORUS, Wallgr.

I have not to hand any species of this genus, and am not certain whether it is a good one; according to the structure, as given by other authors, it may be a development of *Pterophorus*.

## PTEROPHORUS, Wallgr.

Forehead without tuft. Antennæ in male —(?). Palpi short, ascending, 2nd joint loosely scaled, terminal joint short, pointed. Posterior tarsi thickened with scales on joints. Fore wings bifid, cleft from before two-thirds; 2 from three-fourths of cell, 3 and 4 stalked, 5 and 6 short, 7 from hardly below angle, 9 absent, 10 very closely approximated to 8 at base, 11 from four-fifths of cell. Hind wings trifid, 3rd segment without black scales in cilia; 2 from middle of cell, 3 absent, 5 and 6 very short, 7 to apex.

Characters drawn from *P. monodactylus*, besides which there is no other species certainly referable here; a development of *Mimesoptilus*.

## DOXOSTERES, n. g.

Forehead with projecting tuft of scales. Antennæ in male ciliated ( $\frac{1}{2}$ ). Palpi moderately long, porrected, 2nd joint loosely scaled, tending to be tufted above towards apex, terminal joint moderate, cylindrical, obtuse. Tibiæ simple. Fore wings bifid, cleft from two-thirds; 2 from near angle, 3 and 4 short-stalked, 5 and 6 short, well-defined, 7 absent, 9 absent, 10 from very near angle, 11 from near 10. Hind wings trifid, 3rd segment without black scales in cilia; 2 from before middle of cell, 3 and 4 short-stalked, 5 and 6 very short, 7 and 8 slightly divergent.

Also a development of *Mimescoptilus*; at present I am acquainted with only one species, *D. canalis*, Walk., Brit. Mus. Cat., 944.

#### MARASMARCHIA, n. g.

Forehead with projecting tuft of scales. Antennæ of male ciliated. Palpi moderate, ascending, slender, terminal joint moderate, pointed. Tibiæ simple. Fore wings bifid, cleft from before two-thirds; 2 from near angle, 3 and 4 from point of angle or stalked, 5 and 6 short, 7 from near below angle, 8 and 9 stalked, 10 absent, 11 from near angle. Hind wings trifold, 3rd segment without black scales in cilia; 2 from before middle of cell, 3 and 4 short-stalked, 5 and 6 very short, 7 and 8 divergent from beyond cleft.

Derived, like the two preceding, from *Mimescoptilus*, and formed to include *M. phæodactyla*, Hb., and a second species, described below.

#### MIMSEOPTILUS, Wallgr.

Forehead with projecting tuft of scales. Antennæ of male ciliated ( $\frac{3}{4}$ —1). Palpi moderately long, porrected, 2nd joint with loose rough scales, tending to be tufted above towards apex, or tolerably filiform, terminal joint moderate or short, cylindrical, obtuse or tolerably pointed. Tibiæ simple. Fore wings bifid, cleft from about two-thirds; 2 from about two-thirds of cell, 3 from near angle, 5 and 6 short, 7 from below angle, 8 and 9 stalked, 10 from rather near 9, 11 tolerably remote or rather near 10. Hind wings trifold, 3rd segment without black scales in cilia; 2 from before middle of cell, 3 from before angle, 5 and 6 very short, 7 and 8 divergent from beyond cleft.

This is without doubt the oldest of all the known cleft-winged genera, and is the true typical form of the family, being itself descended from a common ancestor with *Agdistis*.

#### AGDISTIS, Hb.

I have here no specimens for examination, and can therefore add nothing to the characters of this genus.

#### CENOLOBA, Wlsm.

I have not seen this genus, though stated to be Australian. If the extraordinary characters given for it are

really correct, it would follow from the presence of maxillary palpi that the genus could not be genealogically developed from any other known genus of the family, and must therefore represent a modification (probably much degraded) of a still older type; on the principle that an organ once wholly lost cannot again recur. From the alleged absence of the third segment of the hind wings (if not accidentally broken) no inference could be drawn without investigation of the neuriation. In the absence of further material I merely suggest these points for consideration.

#### ALUCITA. Z.

Ocelli present, concealed. Antennæ in male minutely ciliated (4). Palpi long, curved, obliquely ascending, 2nd joint with rough projecting scales beneath towards apex, forming a more or less prominent tuft, terminal joint moderate or long, pointed, slender or thickened in front with rough scales. Posterior tibiæ sometimes partially rough-haired above, outer spurs half to two-thirds of inner. Fore wings six-cleft; no cell; 5 and 6 absent, 7 free, 9 and 10 absent, 11 out of 8 before or beyond cleft. Hind wings six-cleft; no cell; 5 absent, 6 out of 7, 8 free.

The affinities are discussed above.

In the sixth volume of the 'Linnæa Entomologica' Zeller suggested the name *Diacrotricha* for a subdivision of *Pterophorus* (as then understood, nearly equivalent to the present family), to contain one species, *P. fasciola*, Z., characterised especially by the terminally dilated and flattened hair-scales of the occiput; although I regard this character as insufficient, it is possible that the genus may be tenable on other grounds: it is, however, unknown to me.

The following species appear to be new:—

#### *Cosmoclostis aglaodesma*, n. s.

♀, 18 mm. Head and palpi ferruginous, frontal ridge white. Antennæ whitish. Thorax silvery-white, anterior margin very narrowly, posterior margin rather broadly, ferruginous. Abdomen ferruginous, segments marked alternately with a large trapezoidal silvery-white spot dilated behind (four in all), or with two small longitudinal white marks, beneath wholly silvery-white. Legs ferruginous, anterior pair blackish-ferruginous, obscurely banded

with white, middle pair sharply obliquely banded with white. Fore wings cleft from before one-third, segments linear; silvery-white, with ferruginous markings; a narrow streak along costa throughout; a slender line along inner margin, strongly dilated near base; a narrow fascia before one-fourth, interrupted below costa; 1st segment with an interrupted fascia almost at its base, an entire fascia before its middle, and another rather near apex; 2nd segment wholly ferruginous, with a white spot rather near its base, and two white fasciæ opposite the two posterior dark fasciæ of 1st segment; cilia pale beneath, on costa ferruginous. Hind wings cleft to base, segments linear; ferruginous-fuscous; cilia light brownish.

A conspicuously distinct and handsome species.

Sydney, New South Wales; one specimen on a fence in September.

*Trichoptilus scythrodes*, n. s.

♂, ♀, 12—13 mm. Head and thorax brownish ochreous, more or less mixed with white. Palpi ochreous mixed with white. terminal joint white, with base and apex dark fuscous, 2nd joint reaching middle of face. Antennæ whitish, annulated with dark fuscous, with a blackish line above. Abdomen ochreous, longitudinally striated with irregular obscure white and black lines, apex in male with two obliquely ascending divergent hair-pencils. Tibiæ white, longitudinally striped with black, posterior tibiæ with dark fuscous median and apical bands, all tarsi with broad blackish bands at apex of joints. Fore wings cleft from before middle, segments linear; brownish ochreous, with scattered dark fuscous scales; one or two white spots on inner margin, and sometimes a suffused irregular white central streak from base to cleft; 1st segment suffused with darker fuscous, with a white bar before its middle and another towards apex, sometimes also a white spot at base; 2nd segment with two corresponding but less distinct white bars: cilia grey, on costa dark grey barred with white opposite fasciæ and white at base towards apex, on lower margin of 1st segment mixed with white and with some black scales in middle, on upper margin of 2nd segment with a row of black scales towards middle, on lower margin of 2nd segment with five spots of black scales, first before cleft, last subapical, and two or three white bars, last anal. Hind wings cleft firstly from before one-third, secondly from base, segments linear; dark fuscous; cilia grey, 3rd segment with a fringe of white hair-scales on inner margin from base to middle, without black scales.

So far as my specimens show, this and the following species are quite destitute of the black scales in the dorsal cilia of the hind wings, possessed by all the other species of the genus; but they certainly do not admit of generic separation; this species is readily recognised by the distinct white markings.

Sydney, New South Wales; Port Lincoln, South Australia; four specimens in November and April.

*Trichoptilus ceramodes*, n. s.

♂, ♀, 14 mm. Head and thorax light ochreous. Antennæ ochreous, with a blackish line above. Palpi pale ochreous, base white, second joint reaching above middle of face. Abdomen light ochreous, with an obscure interrupted blackish line on each side of back; apex in male with two white obliquely ascending tolerably appressed hair-pencils, valves small. Legs white, longitudinally lined with dark fuscous; posterior pair banded with brownish ochreous on middle and apex of tibiæ, and apex of 1st joint of tarsi. Fore wings cleft from middle, segments linear; light ochreous; a small brown spot near inner margin before one-fourth; a cloudy fuscous spot on base of 2nd segment; 1st segment with broad cloudy fuscous basal, median, and apical bands; costal cilia grey, with white spots between the bands; rest of cilia grey, with a few whitish scales, a white bar at anal angle, and another on lower margin before middle of 2nd segment. Hind wings cleft firstly from before one-third, secondly from base, segments linear; rather dark fuscous; cilia light ochreous-greyish, inner margin of 3rd segment with a row of white hair-scales, without black scales.

This species appears to be destitute of black scales in the cilia of both wings.

Sydney, New South Wales; Port Lincoln, South Australia; two specimens in September and November.

*Trichoptilus xerodes*, n. sp.

♂, ♀, 15—16 mm. Head and thorax light ochreous, apex or patagia snow-white. Palpi ochreous, base white, terminal joint whitish, longitudinally striped with black; 2nd joint reaching middle of face, terminal joint nearly as long. Antennæ whitish, annulated with grey, with a grey line above. Abdomen light ochreous, somewhat mixed with white, with a white longitudinal stripe on each side of back, externally bounded by a black line, anal tuft white; apex in male with a small single projecting hair-

pencil, valves large. Legs white, longitudinally striped with black. Fore wings cleft from before middle, segments linear; light ochreous; extreme costal edge slenderly blackish; a white streak along inner margin from base to near cleft; some white scales tending to form obscure bars on both segments about their middle and towards apex; costal cilia blackish, spotted with white on base, with a white basal streak towards apex; rest of cilia dark grey, with a white bar at anal angle, and five small spots of black scales on lower margin of 2nd segment, first close before cleft, last subapical. Hind wings cleft firstly from before one-third, secondly from near base, segments linear; dark fuscous; cilia grey, 3rd segment with two or three black scales on inner margin beyond middle, and a fringe of long white hair-scales between this and base.

The black scales in the dorsal cilia of the hind wings are very slight and inconspicuous, yet always perceptible; the fore wings have obscure whitish markings, and are without any black dots, such as are found in the three following species.

Toowoomba, Queensland; Bathurst, New South Wales; Adelaide, Wirrabara, and Port Lincoln, South Australia; rather common from September to November.

*Trichoptilus leptomerus*, n. s.

♂, 14—15 mm. Head, palpi, and thorax light brownish ochreous; palpi with 2nd joint nearly reaching crown, with tolerably long scales, terminal joint nearly as long as 2nd. Antennæ whitish, longitudinally lined with dark fuscous. Abdomen light ochreous mixed with whitish, with a longitudinal yellowish white dorsal stripe, bordered with deeper ochreous; apex in male with two long fine obliquely upwards projecting divergent hair-pencils. Legs white, longitudinally lined with black. Fore wings cleft from before middle, segments linear; rather light brownish ochreous; a blackish dot before cleft; some white scales towards apex of both segments; costal cilia brownish ochreous, with a spot at two-thirds, another towards apex, and an apical spot white; rest of cilia grey, somewhat mixed with whitish, with a white bar at anal angle, a row of black towards middle of upper margin of 2nd segment, near base, median, and subapical. Hind wings cleft firstly from one-fourth, secondly from near base, segments linear; dark fuscous; cilia grey. 3rd segment with a small spot of black scales on inner margin beyond middle, and a fringe of long white hair-scales between this and base.

Superficially very similar to *T. xerodes*, but easily separated by the distinct black dot before cleft of fore wings.

St. Denis, Island of Réunion; three specimens taken at the end of April.

*Trichoptilus compsochares*, n. s.

♀, 18 mm. Head and thorax ochreous, Palpi ochreous mixed with white, 2nd joint reaching rather above middle of face. (Antennæ broken.) Abdomen ochreous, with longitudinal fuscous lines (partially defaced). Legs white, longitudinally striped with blackish, posterior tibiæ and tarsi banded with fuscous. Fore wings cleft from middle, segments linear; brownish ochreous, 1st segment suffused with fuscous; a minute indistinct blackish dot beneath costa near base; a blackish dot on 1st segment at base; some whitish scales forming obscure bands on 1st segment at about one-third and two-thirds of length; cilia greyish ochreous, on costa barred with whitish on bands, on lower margin of 1st segment with a small subapical spot of black scales, on upper margin of 2nd segment with two or three black scales towards middle and tips white at apex, on lower margin of 2nd segment becoming dark grey on posterior half, with a white anal bar, a white band beneath middle, two or three small spots of black scales towards base, and one beneath apex. Hind wings cleft firstly from before one-third, secondly from base, segments linear; dark fuscous; cilia ochreous-grey, 3rd segment with a small spot of black scales on inner margin beyond middle, and a fringe of white hair-scales between this and base.

Differs from any of the preceding by the distinct black dot on base of first segment of fore wings, and by possessing vein 10.

St. Vincent, Cape de Verde Islands; one specimen received from Mr. G. F. Mathew, R.N., who took it in January, amongst a species of *Chenopodium*, with several others.

*Trichoptilus centetes*, n. s.

♂, 16 mm. Head and thorax light ochreous. Palpi ochreous mixed with white, 2nd joint reaching middle of face. Antennæ whitish ochreous, with a dark fuscous line on back. Abdomen ochreous-whitish, longitudinally striated with interrupted fuscous lines, apex with two obliquely ascending hair-pencils, valves small. Legs whitish, longitudinally striped with black, posterior tibiæ



banded below middle and at apex with dark fuscous (tarsi broken). Fore wings cleft from before middle, segments linear; ochreous-brown, costa and 1st segment darker brown; a moderately large black dot beneath costa near base, another in disc at one-third, and a third on 1st segment at base; 1st segment with a few ochreous-whitish scales before middle and towards apex, intervening space suffusedly dark fuscous; costal cilia fuscous, becoming whitish before middle and towards apex; rest of cilia light greyish ochreous, on lower margin of 1st segment somewhat mixed with whitish, with a spot of black scales beneath apex, on upper margin of 2nd segment with a white spot before middle, some black scales towards middle, and tips white at apex, on lower margin of 2nd segment with a broad dark grey blotch before anal angle, bordered on each side with a whitish bar, and a small apical spot of black scales. Hind wings cleft firstly from before one-third, secondly from base, segments linear; dark fuscous; cilia ochreous-grey, 3rd segment with a spot of black scales on inner margin at three-fifths, and a fringe of white hair-scales between this and base.

Principally distinguished from *T. compsochondes*, with which it agrees in neuration, by the conspicuous black subcostal and discal dots; there are also some other slight comparative differences; but I think it not unlikely that the discovery of forms from intermediate localities may show that these two are only geographical races of the same species.

Port Moresby, New Guinea; one specimen received from Mr. G. F. Mathew, taken with others in November.

*Sphenarches synophrys*, n. s.

♂, 16 mm. Head and thorax brownish ochreous, apex of patagia white. Palpi fuscous, base whitish. Antennæ fuscous, annulated with whitish. Abdomen whitish ochreous, with a central dark fuscous line, dilated to form small blotches at one-third and apex, and a large angular blotch at two-thirds, and with dark fuscous lateral lines, apex whitish, with two obliquely ascending hair-pencils. Legs white, longitudinally striped with black, posterior tibiae and tarsi banded with blackish. Fore wings cleft from before middle, 1st segment tolerably linear, 2nd segment posteriorly moderately dilated, hind margin concave, anal angle sharply defined; ochreous-brown, costal edge mixed with blackish and whitish scales; a black dot beneath costa near base, another in disc before one-third, and a third on inner margin of 1st segment at base; an indistinctly inwardly oblique whitish band on 1st

segment before its middle, and a less distinct one towards apex, both indicated also on 2nd segment; a black line along hind margin of 2nd segment; costal cilia dark fuscous, barred with white on bands; rest of cilia light greyish ochreous, lower margin of 1st segment with four spots of scattered black scales, 2nd median and largest, upper margin of 2nd segment with some black scales towards middle and apex, lower margin with four small spots of black scales, a dark grey patch before anal angle, and a small apical spot of black scales. Hind wings cleft firstly from one-third, secondly from near base, segments linear; ochreous-fuscous, 3rd segment becoming pale ochreous towards base; cilia light greyish ochreous, 3rd segment on upper margin with a tolerably continuous row of black scales from near base to apex, largest about three-fourths, on lower margin with several black scales about one-third, a large tooth of black scales at three-fourths, and a small apical spot, and with a fringe of white hair-scales on basal half.

New Hebrides and Tonga Islands; several specimens taken by Mr. G. F. Mathew.

*Platyptilia hemimetra*, n. s.

♂, 12 mm. Head, palpi, thorax, abdomen, and legs dark fuscous, mixed with grey-whitish; frontal tuft hardly perceptible; palpi with 2nd joint reaching middle of face, terminal joint very short. Antennæ dark fuscous, annulated with whitish. Fore wings cleft from before two-thirds, 1st segment moderately broad, oblong, hind margin straight, somewhat oblique, 2nd segment posteriorly dilated, broader than 1st, hind margin oblique, tarsi sinuate, so as to project in middle, anal angle sharply defined; greyish fuscous, irregularly mixed with whitish and blackish; basal half of costa obscurely spotted with darker and lighter; a cloudy dark fuscous triangular blotch on costa before cleft, reaching across wing to below cleft; a broad cloudy dark fuscous blotch on 1st segment towards its middle, margined posteriorly by an irregular ochreous-whitish line; a transverse ochreous-whitish line near hind margin of 2nd segment, preceded by a dark fuscous suffusion; costal cilia dark fuscous, with three whitish spots; rest of cilia grey-whitish on hind margin, with a sharp black line near base, on lower margin of 1st and upper margin of 2nd segments each with three very small spots of black scales, on lower margin of 2nd segment with five small spots of black scales. Hind wings cleft firstly from two-fifths, secondly from near base, 1st segment narrow, spatulate, 2nd narrow, caudate, 3rd linear, short, only reaching middle of wing; rather dark greyish fuscous; cilia whitish grey, 3rd segment with

a tolerably continuous row of very short dark fuscous scales on both margins, and with a large tooth of black scales on lower margin before apex.

Well characterised by its small size, the obsolescence of the frontal tuft, the medium hind-marginal projection of the second segment of fore wings, and the proportionally very short thick segment of hind wings.

St. Denis, Island of Réunion; one specimen at the end of April.

*Marasmarcha liophanes*, n. s.

♀, 13—14 mm. Head, palpi, antennæ, and thorax pale brownish ochreous, apex of patagia white. Abdomen whitish ochreous, with irregular lateral fuscous lines, anal tuft white. Legs white, longitudinally striped with fuscous. Fore wings cleft from three-fifths, 1st segment parallel-sided, hind margin very oblique, 2nd segment narrower than 1st, not dilated, hind margin very oblique, anal angle indistinct; pale brownish ochreous, posteriorly sometimes more brownish; a small cloudy dark fuscous spot in disc at two-fifths; cilia ochreous-whitish, with a grey spot above apex, a sharp black line near base along hind margin, a grey patch below anal angle, and four small spots of black scales on inner margin. Hind wings cleft firstly from two-fifths, secondly from near base, segments tolerably linear; fuscous; cilia very pale greyish ochreous.

St. Denis, Island of Réunion; two specimens at the end of April.

*Mimesoptilus phæonephes*, n. s.

♂, ♀, 16—20 mm. Head, thorax, and abdomen white, with a few ochreous scales; frontal tuft short, Palpi moderate, slender, ochreous mixed with white. Antennæ white, annulated with fuscous. Legs white, anterior and middle femora and tibiæ suffused with fuscous. Fore wings cleft from two-thirds, segments rather broad, parallel-sided, hind margin of 1st segment somewhat concave, very oblique, of 2nd segment nearly straight, oblique; white, irregularly sprinkled with dark fuscous; costa spotted with fuscous on basal half; a longitudinal dark fuscous mark on fold near base; a small dark fuscous spot in disc at one-third; a dark fuscous suffusion on costa at two-thirds, touching an oblique transverse strong dark fuscous mark on base of cleft; a dark fuscous suffusion on 1st segment towards apex, separated from a narrow hind marginal suffusion by a cloudy white line, these markings sometimes continued over 2nd segment; costal cilia dark fuscous, with a

white band above basal half of 1st segment; rest of cilia white, on hind margin of 2nd segment with a dark grey line near base. Hind wings cleft firstly from middle, secondly from near base, 1st segment moderate, somewhat dilated, hind margin oblique, 2nd segment moderate, parallel-sided, hind margin very oblique, 3rd segment linear, above with a pecten of hairs towards base; whitish; cilia white.

A distinct species, intermediate between the following and *M. celidotus*; this and the following species are especially characterised by the whitish hind wings.

Mount Wellington, Tasmania, at about 3000 feet, in February; three specimens.

*Mimesoptilus leuconephes*, n. s.

♂, 23 mm. Head, palpi, thorax, and abdomen white, with a few scattered fine fuscous scales; frontal tuft short, palpi moderate, slender. Antennæ white, spotted above with dark fuscous. Legs white, anterior and middle pair irrorated above with dark fuscous. Fore wings cleft from two-thirds, segments rather broad, parallel-sided, hind margin of 1st segment subconcave, very oblique, of 2nd segment slightly bowed, oblique; white, very faintly yellowish-tinged, with a thin fine fuscous irroration, 1st segment somewhat suffused with light fuscous; a blackish irroration along basal half of costa, tending to form small spots; a row of four or five small similar blackish spots along submedian fold towards base; a blackish dot beneath costa at one-third, and another near before cleft below middle; some scattered dark fuscous scales beyond middle of 1st segment: cilia white, on costa pale whitish-fuscous. Hind wings cleft firstly from middle, secondly from near base, 1st segment moderately dilated, hind margin rounded, oblique, 2nd segment moderate, slightly dilated, hind margin very oblique, 3rd segment narrow, acuminate: whitish; cilia white.

Allied to the preceding, but very distinct.

Mount Kosciusko, New South Wales; one specimen at 4700 feet, in January.

*Alucita phricodes*, n. s.

♂, ♀, 14—17 mm. Head, thorax, and abdomen dark fuscous, sprinkled with whitish, and tuft whitish; abdomen with a narrow white ring at one-third from base. Palpi dark fuscous, internally whitish, 2nd joint obscurely banded with whitish at three-fourths and apex, terminal joint banded with whitish at one-fourth

and three-fourths; 2nd joint long, porrected, beneath with dense projecting scales on apical half, forming a very short broad truncate tuft, terminal joint about three-fourths of 2nd, anteriorly roughened with scales, somewhat thickened in middle, pointed. Antennæ dark fuscous. Legs whitish, suffused with dark fuscous above, except on posterior tibiæ, of which the basal half is clothed with short rough whitish hairs above. Wings formed as in *A. hexadactyla*. Fore wings with segments blackish, 1st segment with six ochreous white-margined spots, last two largest, remaining five segments with small white and ochreous spots, and an ochreous subapical band; cilia pale greyish, with dark grey obscurely whitish-margined markings, forming three irregular transverse fasciæ; first narrow, about one-fourth; second moderate, angulated outwards above middle, and sinuate inwards below middle; third broader, obsolete near inner margin, towards costa obscurely dilated so as to appear connected with last three anteapical dark costal spots. Hind wings with segments blackish, with small white and ochreous spots; cilia pale greyish; markings obscurely whitish-margined; a rather narrow dark grey fascia before middle, extending from vein 1 to 4; on posterior half of wing three indistinct grey regularly dentate narrow fasciæ, second becoming double on first two segments, and much darker towards inner margin and on posterior costal branch.

Duaringa, Queensland; Sydney, New South Wales; locally common, especially at rest on fences, in August, September, November, and January.

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NOTE. — Lord Walsingham, who has kindly looked through the proof of this paper, suggests that *Cnemidophorus* (p. 6) should be *Eucnemidophorus*, Wallengren himself having substituted this name for *Cnemidophorus*, which is preoccupied. — H. G. and W. W. F.